

THE NAMING OF PLANTS

THE NAMING OF PLANTS

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*To all those who
in endeavouring to satisfy my inquisitiveness
have, knowingly or not,
helped in its preparation
this little book is dedicated*

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I

Introduction

Napoleon once called us a nation of shopkeepers. It would probably be truer to-day to call us a nation of gardeners. Not only are our Public Parks and Gardens maintained at a higher level than ever before, but almost everyone who owns a bit of land, however small, wants to grow something on it, depending on the direction in which his interest lies.

The higher costs of labour and materials have meant in many cases the end of expensive bedding schemes, and some form of garden decoration which will achieve as effective results while being cheaper to maintain was wanted. Flowering Shrubs have supplied the need in many cases and the large influx of new introductions during recent years has made this a most fascinating form of gardening. The practice has reached beyond the great gardens to those of more modest dimensions, so that in all the

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new housing schemes one finds shrubs planted for their flowers or autumn colouring instead of the depressing Privet and Laurel that held sway for so long.

Not only the shrub garden but the herbaceous borders and alpine garden are being continually enriched by the labours of collectors in various parts of the world, and in many a small garden to-day, country or suburban, the newer species are being tried out, talked over and their performances compared.

And so it happens that the number of people who want to know the true names of the plants they are growing has increased enormously. And then come the difficulties ; the names in one catalogue do not always agree with those given in another ; or perhaps when a new plant is ordered, it turns out to be an old favourite masquerading under a new name—which is very aggravating to the person who has spent his *9d.*, only to obtain something he already has. He not unnaturally accuses the nurseryman, who may occasionally be to blame, but as a general rule the nurseryman himself has only used the name under which he received the plant, in all good faith, and both he and his client feel that somebody—probably the botanist—should be able to prevent this sort of thing happening.

Introduction

It is not unusual to hear people suggest that things would be quite simple if botanists would only agree—as though they were Irishmen who enjoyed a scrap. As a matter of fact, the work of the botanist himself would be very greatly facilitated if there were less confusion amongst plant names.

But we shall get nowhere if both sides blame the other ; an acrimonious atmosphere of distrust profits no one. It is in the hope that a better understanding of the problem may, perhaps, help a little towards that final clarification of the difficulties we all desire that this book is offered. In it an attempt has been made to set out as clearly as possible the difficulties and the steps that are being taken to combat them. Perhaps gardeners, who are all very kindly and sporting people when they realize what is required of them, will see that it is possible for them to contribute very materially, if only by helping to develop an informed public opinion. The rules drawn up by botanists are intended to help everyone ; doubtless they are not perfect, but machinery has been devised to amend them as and when it is found necessary.

The gardener can be of the greatest help if he will faithfully follow the rules and not, as some nurserymen unfortunately still do, show ingenuity and imagination in inventing a new

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method of their own. The rules may not be perfect, they may be particularly annoying in the case of the plants one is especially fond of ; but unless we, each and all, not only in this country but throughout the world, agree to abide by some standard, however inadequate we personally may feel it to be, there will be little progress and the next generation will be able to record little improvement in the clarifying of plant names. Every country has its own characteristics ; here we do not take kindly to legislation ; we can be led anywhere but are hard to drive ; our chief guide is convention ; if anything is “ the right thing ” and done by “ the right people,” the rest of us will thankfully follow. Would it not be possible for this generation to build up a convention that it is “ *not* the thing ” to run counter to the established Rules of Botanical Nomenclature ? It is hoped that the following pages may prove a small contribution towards this aim.

II

In General

Everyone who grows and loves plants wants some means of distinguishing between them ; it is quite easy to sort them for oneself by any pet name which seems suitable, but these names are useless when discussing the plants with a neighbour and still more so when communicating with friends in a different country who may not even know the type of plant one is growing. Obviously some generalized system is essential and this must be capable of as wide an application as possible. People living in the same district may get along very well with " common names " and, since these are in a familiar language, they have much to recommend them and hence, from time to time, there comes an appeal for the freer use of common names.

But there are difficulties. For instance, real common names, as distinct from anglicized plant names, are the result of the observations of country people living where the plants are found ; Jack-by-the-Hedge, Jack-go-to-bed-at-

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Noon and others show that something was known of the plants around the village ; but an obvious characteristic would be the first to strike country people and so there is no guarantee that a name is applied to the same plant all over the country ; to quote the classic example, the Bluebell of the Southerner is *Scilla nutans*, but in Scotland this same "common name" denotes an entirely different plant, *Campanula rotundifolia*. Possibly compromise might smooth out the worst of these difficulties, though in the above case it would need a Solomon to arrive at a decision as to which plant really is *the* Bluebell.

Another difficulty is that common names only apply to their country of origin ; they are useless when talking with a native of some other country who has his own set of "common names," in his own language. In some cases it is amusing to find that the common names of certain plants—Forget-me-not = Vergissmeinnicht, Lousewort = Lausekraut, Crane's Bill = Storchschnabel, Stork's Bill = Reiherschnabel (Heron), whilst in France both the latter are Bec de Grue—are merely translations of our own (being British we should naturally assume this to have been the method of procedure, though it is, of course, just possible that we have been the translators !). Then what does one say to such

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names as *sacasil*, *coyonostli*, *huajillo* and *tuna juell*? Yet these are the "common names" of the Mexicans for plants with which they are familiar; incidentally, the first is applied to a Cactus *and* to a *Boussingaultia* and the second word of the last name is pronounced "whay"!

Well then, if common names are inadequate and unsatisfactory, why not use English words to designate the plants we grow? There was a period when this method was considerably in favour and such names as Rockfoil = Saxifrage, Rockspray = Cotoneaster were concocted. Now Rockfoil may be all very well if there is only one plant in question, two or three may be distinguished by such adjectives as Pink Rockfoil, Dwarf Rockfoil and so on, but when there are approximately two hundred species (apart from well-known hybrids) someone is going to have a busy time inventing suitable adjectives and a large number of people will have a still busier time trying to remember them—and, in the end, we are no further forward when communicating with people in other countries.

The fact of the matter is, common names served their purpose adequately in helping country folk to refer to the chief plants that caught their attention in the little world around them; anglicized names may have their use

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for people who grow only a limited number of the more ordinary plants and do not much mind whether they are certain that they are referring to exactly the same plant as their neighbour, but nowadays too many plants are known and freely grown in our gardens to be satisfactorily distinguished by English names.

Let us for a moment consider who it is that most needs accurate names for plants ; the botanist finds some precise method of indicating each plant with which he has to deal essential, and the system now in use is the outcome of botanical work from quite early times. But practical gardeners also want to be able to sort out the plants they grow, and gardeners are of many grades, from the lady who throws away labels as soon as received as the flowers are sufficient without the horrid long names (and quite likely gets interested later and goes round bothering people to name her plants for her !) up to the enthusiast who is half a botanist even if without the specialized training. The trend of modern gardening is more and more towards specialization in various groups, the whole range being almost past coping with by any one individual ; the grower of Alpines now covers a vast field and, if he is to keep in the forefront, he must be able to distinguish a very large number of species ; the same applies to those who

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specialize in shrubs, or in bulbs, and in fact it is only the grower of florists' flowers who has at all an easy time ; he seldom has to bother about the species from which the hybrids originated and need only remember the horticultural names of those hybrids.

Anyone who elects to grow many different plants and wants to be able to discuss them with other growers cannot complain if he has to learn a large number of names ; nor, as a rule, does he complain ; what he objects to, and with some justice, is the fact that when he has learned to call a plant by one name, a botanist makes the discovery that the name he is using is wrong and must be changed. This is all extremely annoying, but perhaps it is not always realized that the botanist does not like it much better ! He does not do it for fun but in the interests of accuracy, hoping by his work to lead ultimately to a really satisfactory system that will be acceptable all the world over. It would be a great help if gardeners would realize that the botanist is not a boggy-man sitting amongst his dried specimens, dropping out at intervals nasty little bombshells to annoy the gardener. On the other hand, it would do no harm if the botanist, on his part, could realize that the gardener is, as a rule, honestly trying to differentiate plants, not as dried specimens, but as

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living things, exhibiting what seem to him considerable differences, to which the botanist sometimes refuses specific rank, though he may give two names to plants which are almost indistinguishable except under a lens.

We naturally dislike things we do not understand, and the International Rules of Nomenclature, the product of many years of serious study, are not easy reading, so it is hoped that a summary of these Rules, together with a brief historical survey of their origin, may be useful ; this, however, will be deferred to a later chapter. At the moment we might profitably consider the difficulties in the way of achieving a satisfactory system of nomenclature.

It is usual to divide the plant kingdom into five groups, the *Thallophytes* (Algae and Fungi), the *Bryophytes* (Mosses), the *Pteridophytes* (Ferns), the *Gymnosperms* (Conifers) and the *Angiosperms* (plants with true flowers). The last group, which is the one of most interest to the gardener, is further divided into *Mono-cotyledons* and *Dicotyledons*, that is plants which have one or two seed leaves respectively ; other characteristics accompany this apparently arbitrary division ; for instance, in *Mono-cotyledons* the veins of the leaves generally run parallel to each other and the number of parts of the flower is a multiple of three,

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there being no clear distinction between green sepals and coloured petals. On the other hand, in the Dicotyledons, the veins spread out like a network in the leaves, the number of parts in the flower is more often a multiple of four or five and there is usually a definite separation into a calyx of green sepals and a corolla of coloured petals. There is also a very distinct difference in the internal structure of the stems of these two groups ; the tissue once formed ceases to multiply itself except in certain definite areas ; in Dicotyledons such an area forms a complete circle so that perennial Dicotyledons can increase in girth forming the well-known " annual rings " visible when a tree is cut down ; in Monocotyledons, the areas of still active tissue form " islands " and little or no increase in girth is possible. Thus all the great trees are Dicotyledons ; on the other hand, all bulbs are Monocotyledons.

Both Monocotyledons and Dicotyledons are divided into Classes which are further subdivided into Orders and these again into Families. A family is a collection of plants which bear considerable resemblance to each other, e.g. Rosaceae, Leguminosae, Cruciferae ; each family consists of a number of genera and the genus is again split up into species. When referring to a given plant it is usual to use the

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generic and specific names ; thus the plant belonging to the family Rosaceae in the genus *Rosa* and species *Moyesii* is known as *Rosa Moyesii*. Sometimes plants resemble each other sufficiently to be regarded as belonging to the same species and yet show slight constant differences ; in this case a third name may be added to indicate that the plant in question is a subspecies, variety or form of the type—the distinction between these three being one of degree. In horticulture, “variety” is most commonly used.

The present system of naming plants is the outcome of many centuries of work, from the time when names were given to individual types of plant to distinguish them but without reference to other plants, up to the present day when the classification is designed to show the relationships existing between the various types.

When the early scientists began to sort out and give names to the limited number of plants within their ken, it was generally assumed that each kind of plant was specially created and that its type remained constant, so that there were, presumably, a definite number of species in the world and, if each was given a name when it was discovered, the accuracy of the names need not be called in question.

Of course, there was always the danger that two different workers would name the same

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plant unbeknown to each other, as indeed happened ; this looks as if it should be easy to correct, but one of the great difficulties for later generations who work over old material is that the descriptions were very inadequate, the plants being imperfectly understood, so that some are still doubtful.

As more and more plants became known, it was soon obvious that the species were not as clearly defined as was at first thought ; till gradually the theory of evolution was built up and proved an excellent working hypothesis. The method of development and the causes which determine it are still a matter of discussion, though it is clear that the plants we know to-day have evolved through countless ages from simpler forms ; but what is not always realized is that the processes of evolution did not cease when Darwin published his "Origin of Species" ; they are, in fact, still operating and some of the species with which we are now quite familiar must be regarded as unstable species, that is to say, they are still evolving, and many forms occur which, though not identical, are very near others, with transition forms in between them, so that the conception of a species becomes a very different and much more complicated one than that presented by the idea of "special creation."

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The number of plants, even if we consider only those with true flowers, is so vast that no human mind can grasp them without finding some method of pigeon-holing them. One method is by counting some obvious feature and putting together, say, all those flowers which have a certain number of stamens or stigmas ; this plan was adopted in what is known as the Sexual System and led to some curious plants being put together. Thus, to quote from the “ English Flora ” (1823) of Sir J. E. Smith, where the system is still used as forming a convenient key, we find the following genera in juxtaposition :

CLASS VI. HEXANDRIA, ORDER I. MONOGYNIA

	<i>Family</i>
Frankenia	Frankeniaceae
Berberis	Berberidaceae
Peplis	Lythraceae
Leucojum	Amaryllidaceae
Galanthus	„
Narcissus	„
Convallaria	Liliaceae
Hyacinthus	„
Asparagus	„
Allium	„
Anthericum	„
Narthecium	..

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	<i>Family</i>
Ornithogalum	Liliaceae
Scilla	„
Fritillaria	„
Tulipa	„
Acorus	Araceae
Juncus	Juncaceae
Luciola (Luzula)	„

The Families to which these plants are now considered to belong have been added.

Here Dicotyledons and Monocotyledons find themselves classed together, the Barberry with the Snowdrop ; a very artificial system this. But the idea of evolution suggested that if plants were descended from earlier types it should be possible to arrange them in such an order as to bring out their natural relationships. Classification in accordance with natural affinities is still the method adopted but, unfortunately for our convenience, evolution did not follow along a number of straight lines ; it is often represented as a tree with the plants we know to-day at the ends of the twigs ; but the lower branches are at times hidden in the mist, we do not see the whole as a clear plan, so that the final results are open to different interpretations.

And this is the crux of the whole matter ; the business of naming plants depends entirely on the vagaries of the human mind ; there can

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be no fixed rules, for the subject does not admit of it ; everything is so tangled and indefinite that several interpretations may be equally probable and will be acceptable to different groups of people.

Let us get this clearer. The whole of classification depends on the concept of species. What is a Species ? Since we have ceased to regard each species as a separate creation, we must find a new definition. It is usual to define a species as a plant which reproduces itself true from seed ; this is rather a difficult criterion to apply to plants of slow growth, for instance, and does not greatly appeal to botanists who deal largely with specimens in the dried state.

Roughly, it may be said that if two plants resemble each other in all particulars—size and number of parts—they belong to the same species. But this depends on what is meant by “resemble each other in all particulars” ; plants are not like physical or chemical entities, they cannot be subjected to exact measurements ; they are living things and their actual size and form depends on the conditions under which they grow. For instance, *Lotus corniculatus*, the Bird’s Foot Trefoil, is a familiar plant to many people who would be able to identify a specimen found in the fields without difficulty. When growing near the sea, the

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leaves may become slightly succulent and take on a bluish tinge due to a coating of wax on them. Is this seaside form to be considered as belonging to the same species or to a different one? The flowers will be similarly constructed in both cases, though those growing by the sea are often orange instead of the pure yellow of their inland relatives. Probably most people would agree and call the two plants the same, since they vary only in the texture of the leaves. But should they be regarded as identical or should one be considered as a varietal form of the other? Hooker, in the "British Flora," gives the normal plant as *Lotus corniculatus* and the maritime form as *Lotus corniculatus* var. *crassifolius*; again, many people would regard this as a satisfactory solution. But the fact remains—and herbarium specimens will give no indication of it—that, if the maritime form is transplanted to a situation inland, it will revert to the normal form, that is to say, there is no inherent difference in the two forms, which are merely the result of different environments. But perhaps this is an unstable species, still in process of evolution, and one day the succulent habit induced by the conditions on the coast may be so impressed on the plant that bringing it inland will have no effect on it and it will continue to produce succulent leaves;

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then we (or rather our remote successors, for evolution works very slowly) must think again and perhaps it will have to be considered as a different species.

A case like this shows that the question of naming plants really rests on interpretation of the facts and, as no two people ever think quite along the same lines, there are bound to be differences of opinion leading to variations in the names adopted by different workers.

Botanists working on the subject of classification are sometimes divided into "lumpers" and "splitters." At one time there was a tendency to regard all small variations as worthy of specific rank, so that some genera were divided into an enormous number of species, many of them, to the ordinary person, very much alike. A revulsion of feeling resulted in a tendency, now more in vogue, to take a much wider view of the species concept and only to raise variations to specific rank when there is clear evidence that they vary in important particulars and that the variations are constant.

As an extreme instance of "splitting" may be mentioned the "Handbook of the British Rubi," by the Rev. W. Moyle Rogers (1900), in which as many as 103 species were established (with many varieties) of the English Bramble; Hooker, in his "Student's Flora

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of the British Isles," gives four species and twenty-two sub-species. Willis, in "Flowering Plants" (1908), says: "*Recent investigations seem to show that Rubus is a genus in which the continual production of new forms, by mutation and by hybridization, is going on.*" This is clearly a case where a wide view should be taken if a tremendous influx of new names is to be avoided. Yet the author of the Monograph was perfectly honest in regarding the variations as important, and if the number of new epithets required had not been so enormous, the work would have been less likely to have caused discussion and dissension.

On the other hand, consider *Potentilla fruticosa*; the gardener, who finds many uses for this most attractive shrub, knows that the only way to get what he wants is personally to choose the plant in the nursery and not to trust to the catalogue. The species has a very wide distribution in the northern hemisphere in both the Old World and the New, so that it is hardly surprising that it should show variations, but the gardener who is asked to accept a small six-inch shrublet of compact habit with yellow flowers and a bush three feet high with silvery foliage and creamy flowers as the same plant may be forgiven if he is a little puzzled. Actually the answer is that whilst the classification of *Rubus*

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was undertaken by a "splitter," *Potentilla* has been in the hands of a "lumper." Neither was wrong ; it is simply a matter of opinion ; the best that can be hoped for is that an informed public opinion will arise and have sufficient force to make it quite evident that the concept of species must be on broad lines so that the needless multiplication of names is avoided.

Botany is an old science now and it would seem as if the ground work should have been fixed once for all, so that the unbotanical may be surprised to find that even the characteristics determining such well-known families as *Liliaceae* and *Amaryllidaceae* have been called in question. It is too early yet to say what will finally be the accepted form, but Dr. J. Hutchinson has been carrying out a careful revision of both *Dicotyledons* and *Monocotyledons* and he proposes some important changes ; it hardly concerns the gardener yet, but as both families are well known it may be interesting to glance briefly at one of the changes proposed.

Those who learnt Botany at school will remember that one could distinguish the families *Liliaceae* and *Amaryllidaceae* by the fact that the ovary was above the petals, i.e. superior (*Lily*, *Tulip*) in *Liliaceae* whilst in *Amaryllidaceae* the ovary was inferior, i.e. below the petals (*Daffodil*, *Snowdrop*)—a beautifully simple dis-

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tion which has now been challenged by Dr. Hutchinson ; he considers that the type of inflorescence in this case is of more importance than the position of the ovary and puts together those plants whose flowers are in umbels with an involucre of bracts and places these in Amaryllidaceae, regarding the Liliaceae as always without spathes or bracts. As a result, the genera *Allium*, *Brodiaea*, *Leucocoryne*, *Agapanthus* and others are transferred from Liliaceae to Amaryllidaceae. A new family is proposed, Agavaceae, to include *Phormium*, *Yucca* and *Dracaena* from Liliaceae and *Agave* and *Furcraea* from Amaryllidaceae ; *Smilax* is transferred to a new family, Smilacaceae, whilst *Philesia* and *Lapageria* leave Liliaceae for the new family Philesiaceae ; this gives only a bare outline of the proposed changes. These alterations imply no change of name for the gardener's plants and are only of interest to those gardeners who like to know something of the relationships of their plants, but the case is useful in illustrating how further knowledge and consideration may necessitate changes in even well-known families.

III

Characters used in Classifying Plants

People who are not botanists are sometimes puzzled to know how plants are classified ; some species resemble each other closely and one is not surprised to find that they are grouped together, but with others the connection is not nearly so obvious.

If the purpose of classification is merely to get plants sorted for easy reference, any characteristic could be chosen ; for instance, suppose all the plants whose leaves are arranged in a rosette were classed together, then we should get *Sempervivums*, *Saxifrages*, *Haworthias*, *Aloes*, *Androsaces* and many other types grouped together. But in this case we have chosen a characteristic which depends on environment ; the leaves are crowded together as a protection from drought (physiological or actual) and excessive sunshine and, in fact, our group represents a mixture of alpine and desert plants. This sort of classification may be useful for some purposes, but anyone who has ever

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handled these plants will feel that a class which includes plants so diverse as those mentioned above is an artificial one ; it gives no indication as to whether the different plants are related to one another but merely shows that they live under similar conditions.

We have seen, however, that the theory of evolution suggests that plants *are* related to each other, so that what is wanted is to find those characters which are, on the whole, least likely to change with environment and most likely to lead to a natural classification.

Suppose we take two similar Wallflower seedlings and plant one in the crevice of a wall and the other in good garden soil, how will the adult plants compare with each other ? The one that has grown in the wall will have pushed out long straggling roots as far as possible along the crevices, searching for food and moisture ; its stem will be woody and the leaves a greyish green. But the plant in good soil will have a ball of fibrous roots, softer stems and larger, greener leaves ; in fact, if it were not known that the seedlings were from the same batch, the grown plants might well be thought to belong to two different species. But if we examine the flowers we shall find that they are identical in structure ; four green sepals surround four coloured petals set in the form of a cross ; both

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sepals and petals are quite separate from each other. Within are six stamens and a small green ovary ; if the ovary is dissected it can be seen that it is made up of two carpels (as shown by the two seams) and that a partition is stretched across the centre ; there are a number of ovules which, if fertilized, will turn into ripe seeds. Though the plants themselves differ in appearance, the flowers are similar.

Now look at other plants in the garden and see if any of them have similar flowers. Aubrietia has four petals and close examination reveals six stamens and a similar ovary between them ; Honesty (*Lunaria*) also has four petals and six stamens, and here the ripe fruit shows the characteristic partition across it very well, for it is to this that the plant owes its decorative value, when the dried walls of the fruit and the seeds have fallen and only the silvery partition is left. Try other flowers, Stocks, Arabis, Draba, Morisia—all have four petals, six stamens and the characteristic ovary ; though this may differ in shape, yet it always consists of two carpels with the partition between them.

We have now found characters that are common to a number of plants and, moreover, do not vary if the plant is grown under different conditions. But perhaps all flowers with four

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petals also have six stamens and the same form of ovary. In many rock gardens the little blue *Houstonia* is grown, its small petals arranged like a cross ; does this then belong to the same group as the Wallflower ? Pull it to pieces, there are *four* not six stamens, and moreover the petals are not free to the base but joined together and they are *above* the ovary instead of enclosing it. Again the Willow Herb, *Epilobium parviflorum*, which is a pestilential weed in many gardens, has four mauve petals but, again, these are sitting on the long slender ovary instead of surrounding it and there are *eight* stamens here. In fact, the more flowers we examine, whether with four petals or five, the more we shall realize that to have six stamens and four petals is a very unusual arrangement ; the number of stamens is nearly always the same as or a multiple of the number of petals.

We have then arrived at distinctive features which may be taken as characteristics to be used in classifying plants. The six stamens and form of the ovary are the characters used to define the family Cruciferae, so called because the petals are usually arranged in the form of a cross. The leaves may vary from the large glaucous ones of the garden Cabbage to the narrow, downy leaves of the Stock ; the growth

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of the plants varies from rosette plants like *Draba* and *Morisia* to herbaceous plants like *Honesty*, and different conditions of growth will alter these vegetative characters but, however the plants are grown, the structure of the floral parts is essentially the same ; it is by the floral characters and not by the vegetative that plants can be classified so as to bring out their natural affinities.

In the family we have considered, the Cruciferae, there is a certain amount of resemblance in the form and position of the leaves ; in some families this is much more marked as in the Pink family (*Caryophyllaceae*) where the arrangement of the leaves in pairs up the stem, often with swelling at the nodes, is familiar to everyone who grows these plants ; it makes them easy to recognize but, unless the floral form also agrees, the arrangement of the leaves alone is not sufficient ; vegetative characters can only be regarded as confirmatory, not decisive in themselves.

And this will be found to hold throughout the large group of plants which bear true flowers (as distinct from the Ferns, Mosses and Fungi) ; the floral characters are the most reliable guides when seeking the natural relationships of plants. The flower is the final development of the plant on which it depends for the future existence of

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the species ; the plant which bears it may alter its form, within limits, to meet adverse circumstances because on it depends the successful production of the perfect flower.

We took as example a family which has fairly obvious characters that can be readily seen with the naked eye, such as the number of stamens and form of the fruit. Naturally it is not always as straightforward as this and much work may have to be done on the structure of the immature seeds, the position they assume, whether they have a supply of reserve food (endosperm) or not and other details.

The characters used will not be the same in all families ; in the Orchids, for instance, the chief family characteristic is the form taken by the pollen ; instead of being powdery and dry as is usual, it is united into sticky masses, this being part of the complicated mechanism which has been evolved to secure pollination. In the Asclepiadaceae too, the pollen is united into sticky masses, but there is also a curious structure within the petals and surrounding the stamens and ovary ; this is known as a corona and is usually divided into an inner and outer corona, the various forms assumed being useful in distinguishing the species. Compositae, again, is distinguished by the crowding of the small individual flowers into a complicated

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inflorescence which resembles a single, large flower.

In the example chosen, we have seen how it is possible to assign a flower to the family to which it belongs ; six stamens and a special form of ovary indicates the family Cruciferae. But this does not distinguish between the different species since they all have these characteristics ; the leaves and general habit of the Wallflower (*Cheiranthus*) are not particularly distinct from those of the Honesty (*Lunaria*), but the seed pods are quite different in shape, being long and narrow in the former and almost circular in the latter. The more nearly plants are related, the finer are the points necessary to distinguish them, which, as we have seen, may lead to differences of opinion amongst workers as to whether two plants differ sufficiently from each other to be regarded as two species or not.

Classification implies the arrangement of the units, the species in this case, in groups according to the relationship between them. The Common Stock and the Night-scented Stock resemble each other closely, though the lilac flowers of the latter are closed during the day, opening later when their familiar perfume fills the evening air ; the botanical names of these two plants are *Matthiola incana* and *Matthiola*

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bicornis, that is to say, the two species are regarded as belonging to the same genus, *Matthiola*. To complete the classification, genera which resemble each other may be grouped together into Families (which used to be called Natural Orders); Families which show affinities will be classed together into Orders (once called Cohorts), Orders are grouped into Classes and the Classes into Divisions; where necessary, subsections of any of these groups may be recognized. To return to the Stock, its relationship to the rest of the plant world may be expressed thus:

Division	Angiospermae
Class	Dicotyledoneae
Order	Parietales
Family	Cruciferae
Genus	<i>Matthiola</i>
Species	<i>Matthiola incana</i>

That is to say, the Stock, *Matthiola incana*, is one of the species of the genus *Matthiola* which belongs to the family *Cruciferae*; the family is united to others whose ovules are borne in a similar manner in the order *Parietales* which, on account of the *two* leaves or cotyledons of the seedling, are classed as *Dicotyledoneae* and the Dicotyledons, together with the Monocoty-

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ledons where there is only one seed leaf, are grouped together as *Angiospermae* because the ovules are enclosed in an ovary, in contradistinction to the *Gymnospermae*, where the ovules are naked, borne on scales. The Angiosperms include all the plants with true flowers whilst the Gymnosperms cover the Conifers, Cycads and similar plants.

This, then, is the work of the systematic botanist, the examination of characters of plants to find the relationships between them. The work was begun when botanists first realized that plants were not specially created, and therefore distinct entities, but were derived from primitive ancestors and so bore some relationship to each other ; further investigation has shown and is still showing that some of the early work was inaccurate because, very often, the structure of the plants was not sufficiently understood. Any worker on the subject is entitled to his own views ; anyone can, if he chooses, put forward an entirely new basis of classification. Its acceptance, however, is another matter ; the great collections, living and dried, in the Botanic Gardens and Herbaria of the world are an insurance against frequent changes ; when the number of specimens included in them runs into hundreds of thousands there must be some very strong

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reason advanced before any change-over is attempted.

There is another period of its life when a plant may show unusual features and that is in the seedling stage. Though so many plants begin life with two tiny green leaves, these are often so characteristic that a gardener can very early sort the weeds out of his seed-boxes, even before the first true leaves appear. These first true leaves do not always resemble those which will come after. Many people will have seen Gorse seedlings out on the moors ; the first leaves are soft and trifoliate and quite unlike the dark-green thorns that will clothe the plant later on, but they are strikingly like other leguminous plants and give confirmation—if such were needed—of consanguinity. Gardeners who grow *Acacias* (such as *A. longifolia*) from seed will have noticed the same thing ; small plants have pinnate leaves at first and later the phyllode or flattened leaf-stalk begins to develop ; under too moist conditions, however, little leaflets will develop at the tips of these phyllodes.

For the first few weeks of its life a seedling may be repeating the early history of its race, and a thorough and systematic investigation of young seedlings would add very considerably to our knowledge of plant affinities—which is

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another reason for the botanist occasionally to leave his herbarium and venture at least as far as the greenhouse.

As a matter of fact, that is one of the complaints the gardener is apt to make of the botanist, he deals only with dried material ; it is even said that some botanists cannot recognize a growing plant but must first have it pressed and dried and neatly spread out on a herbarium sheet. Now the gardener knows from experience that plants will vary quite considerably as a result of different conditions of cultivation ; an alpine may be much more compact when grown on the scree than if placed in richer soil, though in all essentials the plants remain the same and, consequently, he prefers a rather wide conception of species and is suspicious of people who work on minute hairs and such apparently insignificant details. Probably, in most cases, there is a good deal to be said on both sides ; without herbarium material which has been preserved from earlier times and is continually being added to, the confusion in plant names would be even worse ; it has, in many cases, been possible to refer to the actual plant from which the original description was made. A dried plant stuck on a sheet of paper does not mean much to the average person, but it must be remembered that to a botanist used

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to dealing with such things it means a great deal more than to the layman ; much is lost, colour as a rule, but the main form remains and careful examination by an expert will reveal most of the essential details.

There is another point where the cultivation of plants can be of great help and that is in the case of a possible hybrid. Hybrids occur in nature, as well as being the artificial product of the gardener, but sometimes when a plant is collected abroad and sent home, there is nothing to tell whether it is a true species or not ; if it closely resembles another species, or appears to be intermediate between two known species, the botanist may suspect a hybrid, but only by growing on seeds is it possible to be certain ; if the offspring all resemble the parent plant the chances are that it is a true species, and if the offspring of the second generation are also alike then it is fairly clear that there has been no hybridization. If, on the other hand, the offspring are not all similar, it will probably be possible to sort out the parent types. This method is a perfectly practical one, but it is certainly rare to hear of such a test being made as part of the routine of naming plants.

Many people who grow plants are interested to know to which family they belong, but the important point for the gardener is to be able

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to name the individual species he grows and, for these names, he is dependent on the botanist. Let us then see how the botanist is proposing to sort out the confusion into which plant nomenclature has fallen.

IV

International Rules of Nomenclature

From the earliest times when man first noticed and used, as food or medicine, the plants around him, some sort of name was probably given to each ; in primitive societies it was the "medicine man" who was most concerned with plants and his often quite considerable knowledge was jealously guarded and passed on by word of mouth only ; in fact it is not till about 400 B.C. that the first written botanical works appeared, two books by the Greek philosopher Theophrastus, "*Historia Plantarum*" and "*De Causis Plantarum*." Theophrastus had a surprisingly wide understanding of plants and the descriptions he gives are, for the period, fairly intelligible ; in the two books he mentions some five hundred different species. Unfortunately the science of botany made little progress after this time, being largely in the hands of the herbalists who were more interested in the properties of plants than in their structure, and it was some

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eighteen centuries before any real advance was made.

In the sixteenth century there arose in Germany a school of workers, Brunfels, Fuchs, Bock and others, who began seriously to study the structure and classification of plants ; it was the age of the Renaissance and these writers went back to the old classical writers such as Theophrastus and Dioscorides and tried to identify the plants they had enumerated with those they found around them ; unfortunately they did not realize that plants growing in Greece are not necessarily also native to Germany and, in some cases, they forced descriptions to fit plants for which they were never intended. However, a large number of illustrations were provided which were certainly of great assistance to later workers in indicating the plants intended. Since Latin and Greek were the languages of the learned in the Middle Ages, most of these early botanical works were written in one or other, usually Latin.

It is for this reason that most of the earliest recorded names of plants are in Latin, a language which, at the time, could be almost universally understood by the better-educated classes and which, even to-day, is still in use throughout the world as the language of the natural sciences. In those herbals which were

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translated or written in the vernacular, the names were still given in Latin with a translation appended.

The herbalists did much good work in enumerating the known plants, even if their descriptions leave a good deal to be desired ; gradually the need to classify plants, putting together those which showed some affinities, instead of arranging them alphabetically, became more urgent and investigations into plant form were pursued to determine which plants most resembled each other ; thus an insight into physiology and the structure and use of the various organs was obtained and botany became a science.

Kasper Bauhin was one of the first to discard the alphabetical arrangement in his " Pinax " published in 1623, and Tournefort advanced classification considerably further by making use, for the first time, of the characters of the flower. Both these workers more or less recognized the genus as a means of grouping together the different species, but the names in use, apart from the general confusion of wrong application owing to inadequate descriptions, were becoming very cumbersome ; in an endeavour to distinguish between nearly related plants more and more adjectives were added till the names themselves became descriptions of

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the plants. Thus the Crocus which we know to-day as *Crocus reticulatus* was by Tournefort known as *Crocus orientalis vernus, flore subcoeruleo, externe spadiceo-rubente*, and by Clusius as *Crocus vernus latifolius, flavo varioflore*. Bauhin tried to reduce the complexity of these long names and in his "Pinax" chiefly used two words only.

Linnæus is often spoken of as though he were the greatest botanist of his day ; in a sense this is not true, for there were many points of structure and physiology already well understood of which he was ignorant. But his claim to distinction lies in his quite extraordinary powers of description, of indexing and clarifying the earlier work so that his two books "Genera Plantarum" (1737) and "Species Plantarum" (1753) have been taken as the starting-point of modern nomenclature. If he did not actually originate binomial nomenclature, he at least undertook the stupendous task of going through all the plants then known, reducing their names to two words (with the occasional addition of a third to distinguish varieties) and providing descriptions of each plant, descriptions which are sufficiently full and accurate to provide later workers with a clear idea, in the majority of cases, of the plants intended.

The usefulness of the binomial system was so

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obvious that it was quickly adopted by workers in many countries. This was an age of travel and new plants were continually being discovered ; they were examined, classified and named by botanists in many different places so that sometimes the same plant would be given different names by different workers ignorant of each other's labours. There were no rules governing nomenclature and each author was a law unto himself so that things became chaotic. The great French botanist Alphonse de Candolle was entrusted with the task of drawing up a code of rules which could be discussed at an International Botanical Congress to be held in Paris in 1867.

The most important contribution made at this first Congress was the recognition of the law of priority, that is to say, the oldest known name which could definitely be assigned to a plant must be considered as the correct one. A large number of botanists agreed to follow the Paris Code, but other systems were put forward and found many adherents.

In practice, the law of priority did not work as smoothly as was hoped ; one worker might consider he was using the oldest name when an earnest inquirer who pursued his researches yet further might unearth an even older name in some little-known herbal and, by the law,

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this would then have to be used. De Candolle himself saw the difficulties and proposed a series of important amendments in 1883, but it was the publication by Otto Kuntze in 1891 of "Revisio generum plantarum" that really brought matters to a head. In this most erudite work Kuntze had carried his investigations so far that 30,000 names in general use would have had to be altered. Obviously the law of priority could not be carried to its logical conclusion if it led to such an intolerable result.

In 1897 a set of rules was drawn up in Germany for the guidance of collaborators in that great work, Engler and Prantl's "Das Pflanzenreich"; in this a modification of the law of priority was suggested and at the International Botanical Congress at Vienna in 1905 it was finally agreed that only names published in Linnæus's "Species Plantarum" or subsequently should count; thus 1753, the date of publication, was made the artificial starting-point for modern nomenclature and, though earlier names might be consulted if necessary, they were not considered valid if they differed from those given by Linnæus.

One difficulty was still left; even using the date 1753, a certain number of plant names in general use would have had to be abandoned; to avoid this, a list of *nomina conservanda* was

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drawn up to include such names as the Congress considered should be conserved for the benefit of gardeners and nurserymen as well as botanists who had become familiar with a later form which, if the law of priority were strictly applied, would not be valid. This list includes names of genera only and is not concerned with species.

The Vienna Code was adopted by the majority of botanists who realized the importance of working to some rule, if confusion were to be avoided. The Code, even with subsequent modifications, is not perfect, but, if carried out faithfully, it should do a great deal towards clearing up the tangle of nomenclature. But it is only an agreement, with no penalties attached to deal with defaulters. It should therefore be the earnest endeavour of everyone who has any dealings with plant names to carry out as far as possible the terms of this agreement; only in this way can order be brought out of chaos. Individuals may not agree with all the recommendations but, for the common good, it is, to say the least of it, inadvisable to run counter to the generally accepted plan. About 300,000 plants are known to-day; the Vienna Code was laid down in 1905, that is, only thirty years ago, so that we must not complain if this vast number of species is still under investigation and some

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of the names with which we are familiar are found to be wrong ; no one wants to make the change, but unless the case is of sufficient importance for the plant concerned to be included amongst the *nomina conservanda*, the only way to help towards a happier future is to accept the change with as good grace as may be, taking comfort while altering the label (whether in the garden or in one's mind) that if we all work faithfully according to the rule, perhaps future generations may be able to look back and chuckle at the idea that their ancestors had ever suffered from confusion in so precise a subject as plant nomenclature !

The International Botanical Congress meets every five years to consider recommendations submitted to it and, in the light of experience, various minor alterations are suggested. The Congress held at Cambridge in 1930 was an important one, the first held since the War, and the International Rules adopted by the Congresses at Vienna (1905) and Brussels (1910) were revised ; a few minor alterations were made at the last Congress held at Amsterdam in 1935. In their present form the Rules consist of 74 Articles together with 50 Recommendations. Many of these refer to points of procedure which will only concern botanists dealing with research or engaged in naming up plant

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material, but some of them, especially the Recommendations, are of interest to every plantsman who takes more than a superficial interest in his work or hobby.

So much botanical literature appears to be hopelessly abstruse to the layman that the very understanding and human attitude adopted in these rules may come as a surprise; many otherwise good gardeners are showing an increasing disposition to regard the botanist as an enemy (or at least obstructionist) rather than a friend.

Thus, Article 1 states :

“Botany cannot make satisfactory progress without a precise system of nomenclature, which is used by the great majority of botanists in all countries.”

Such a statement is obvious and, in this case, Botany might be taken to include Horticulture.

In Article 2 it says :

“The precepts on which this precise system of botanical nomenclature is based are divided into principles, rules and recommendations. The principles . . . form the basis of the rules and recommendations. The object of the rules . . . is to put the nomenclature of the past in order and to provide for that of the future. They are always retroactive : names or forms of nomenclature contrary to a rule cannot be maintained.

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The recommendations deal with subsidiary points, their object being to bring about greater uniformity and clearness especially in future nomenclature ; names or forms contrary to a recommendation cannot on that account be rejected, but they are not examples to be followed."

The position with regard to taxonomic (systematic) groups and their namings are clearly set out, with examples, so that there can be little question of ambiguity or alternative interpretation ; the gardener is most interested in § 3 and § 4 which deal with the names of genera and species respectively. Thus, under § 3, Article 25 reads :

"Names of genera are substantives (or adjectives used as substantives), in the singular number and written with an initial capital, which may be compared with our family names. These names may be taken from any source whatever, and may even be composed in an absolutely arbitrary manner."

This is followed by Recommendation X :

"Botanists who are forming generic names show judgement and taste by attending to the following recommendations :

- (a) Not to make names very long or difficult to pronounce.*
- (b) Not to dedicate genera to persons quite unconnected with botany or at least with*

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natural science nor to persons quite unknown.

- (c) *Not to take names from barbarous languages, unless those names are frequently cited in books of travel, and have an agreeable form that is readily adaptable to the Latin tongue and to the tongues of civilized countries."*

and five other suggestions of less importance to the gardener. If a plantsman comes on a new name of impossible complexity he should know that it has been made *against* the recommendations of the majority of botanists ; nothing can be done about it except that the stronger the body of public opinion against such names, the less likely they are to be offered in future.

With regard to specific names, Article 27 says :

"Names of species are binary combinations consisting of the name of the genus followed by a single specific epithet. If an epithet consists of two or more words, these must be united or joined by hyphens. . . . The specific epithet, when adjectival in form and not used as a substantive, agrees in gender with the generic name."

Amongst the examples given are *Helleborus niger*, *Brassica nigra*, *Verbascum nigrum*.

The gender of the generic names presents

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some difficulty to the layman, for it does not necessarily conform with classical Latin but is that assigned to it by the author, so that it is a question of knowing or of looking it up ; it is not necessarily the same gender as that of the Latin word from which it is derived ; in any case, the names of trees are usually regarded as feminine.

Then follow Recommendations :

“ *XIII. The specific epithet should, in general, give some indication of the appearance, the characters, the origin, the history or the properties of the species. If taken from the name of a person, it usually recalls the name of the one who discovered or described it, or was in some way concerned with it.*

“ *XIV. Names of men and women and also of countries and localities used as specific epithets, may be substantives in the genitive (Clusii, saharæ) or adjectives (Clusianus, dahuricus). It will be well, in the future, to avoid the use of the genitive and the adjectival form of the same epithet to designate two different species of the same genus : for example Lysimachia Hemsleyana Maxim. (1891) and L. Hemsleyi Franch. (1895).*

“ *XV. In forming specific epithets botanists will do well to have regard also to the following recommendations :*

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- (a) *To avoid those which are very long or difficult to pronounce.*
- (b) *To avoid those which express a character common to all or nearly all the species of a genus.*
- (c) *To avoid using the names of little-known or very restricted localities, unless the species is quite local.*
- (d) *To avoid, in the same genus, epithets which are very much alike, especially those which differ only in their last letters.*
- (e) *Not to adopt unpublished names found in travellers' notes or in herbaria, attributing them to their authors, unless these have approved the publication.*
- (f) *Not to name a species after a person who has neither discovered, nor described, nor figured, nor in any way studied it.*
- (g) *To avoid epithets which have been used before in any closely allied genus.*
- (h) *To avoid specific epithets formed of two or more (hyphenated) words.*
- (i) *To avoid epithets which have the same meaning as the generic name."*

The names of subspecies or varieties follow the same form as those of species and are connected to the specific names by the appropriate abbreviation as var. (variety), subsp. (subspecies) or forma ; in horticultural practice var.

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is usually used, though in botanical work it is more correct to specify the rank assigned to the variation from the specific type.

With regard to hybrids it is correct, if the parentage is known, to put the two specific names in alphabetical order united by a multiplication sign thus : *Cistus populifolius* \times *salvifolius* ; if the name of the seed-bearing parent is known, it may be put first (and marked by a sign) : *Digitalis purpurea* ♀ \times *lutea* ♂. If the parentage is unknown, a specific name may be given but should be written with the multiplication sign before it to indicate hybrid origin as : \times *Cotoneaster Watereri*. If a hybrid occurs as the result of grafting, forming what is known as a chimæra, or by any other asexual process, a plus sign is used instead.

If the hybrid is bigeneric, that is, if two species from two different genera have been crossed, a new generic name is required which is usually formed from a combination of the generic names of the parents ; *Odontioda* represents a cross between an *Odontoglossum* and a *Cochlioda*, and the cross between *Cochlioda Noezliana* and *Odontoglossum cirrhosum* is known as \times *Odontioda keighleyensis*. Similarly in tri-generic hybrids, the names of the parent genera may be combined, e.g. *Brassolaeliocattleya*, or, if this method is unsuitable, a new name may

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be coined as Vuylstekeara for hybrids between Cochlioda, Miltonia and Odontoglossum.

For garden plants, Article 35 reads :

“ *Forms and half-breeds among cultivated plants receive fancy epithets, preferably in common language, as different as possible from the Latin epithets of species or varieties. When they can be attached to a species, a subspecies, or a botanical variety, this is indicated by a succession of names. The fancy epithet will be preceded by the letter ‘c.’ Example : Pelargonium zonale c Mrs. Pollock.*” The “ c ” stands for “ culta ” and is preferable to “ var. hort.” sometimes used, which may, by corruption, become confused with “ Hort.” put after a name in place of the authority when the plant is a hybrid of garden origin ; thus a beautiful Cherry long in cultivation in Japan, whose wild type is unknown, is called *Prunus Watereri* Hort. ; in this case “ Hort.” replaces the name of the authority cited after a plant’s name.¹

The articles and recommendations have been given at some length so that gardeners may realize that the very points of objection they themselves have often raised are appreciated by the botanists who, if they cannot actually legislate against them, can at least “ recommend ” ; and the recommendations of so

¹ See page 59.

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important a body as the International Botanical Congress should rank as laws to all working botanists who are honestly trying to make a difficult subject as simple as, in the nature of things, it can be.

To be effective a name must be published ; in Article 36 it is stated that : “ *Publication is effected, under these Rules, by sale to the general public or to botanical institutions, of printed matter or indelible autographs, or by distribution of these to specified representative botanical institutions. No other kind of publication is accepted as effective : communication of a new name at a public meeting, or the placing of names in collections or gardens open to the public, does not constitute effective publication.*” Such publication must consist of a full description of the plant (after January 1, 1935, it is essential (Art. 38) that this be accompanied by a Latin description) and an illustration should be given if practicable. The question of the correct form of publication is carefully gone into in a series of rules and recommendations to insure as far as possible that there shall be no ambiguity or confusion in future. The date of publication is obviously of importance in view of the law of priority and the name of the author of a new name is also important ; thus Article 46 says :

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“For the indication of the name (unitary, binary, or ternary) of a group to be accurate and complete, and in order that the date may be readily verified, it is necessary to cite the author who first published the name in question.

Examples : Rosaceae Juss., Rosa L., Rosa gallica L., var. *eristyla* R. Keller.”

Where a plant has originated in cultivation and cannot be referred to a wild type the name of the authority is replaced by the abbreviation “Hort.”

It is not common garden practice to put the name of the author after the plant's own name on a garden label ; it would add greatly to the complications of life and, moreover, is unnecessary. But it is useful for the gardener to realize the full method of definition which should always be used in botanical writings ; and if there is any discussion of a plant's name and reference books are consulted it is well to examine the authorities. One sometimes finds such references as “*Daphne sericea* Vahl. (*D. alpina* Savi non L.)” ; this means that the plant whose real name is *Daphne sericea* was called *Daphne alpina* by Savi, but the name *Daphne alpina* had also been used by Linnæus for another species which still bears this name. If the name *Daphne alpina* is used without the authority it might refer to either plant, that so

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named by Linnæus or the other one named by Savi.

Sometimes one of the names thus referred to has never been applied to plants in the garden but is given in some flora or revision of the genus and, though the botanist must take account of it, the gardener is not affected. But sometimes both names have been used for plants in cultivation and then the layman is apt to find matters very confusing. For instance, the name *Crassula deltoidea* has been twice given and to different plants; in 1886 Dr. N. E. Brown described a plant under the name of *Crassula rhomboidea*, but comparison of the type sheet in the Kew Herbarium with that of a plant in the Herbarium at Upsala and named *Crassula deltoidea* shows that the two are identical; therefore, in accordance with the law of priority, the older name, that given by Thunberg in 1778, must be used and *Crassula rhomboidea* N.E.Br. becomes *Crassula deltoidea* Thunberg. In the meantime, however, Harvey in "Flora Capensis" had described another plant as *Crassula deltoidea* and, though the name has been adopted and used by other writers, it is no longer valid, so a new name has had to be found for it and *Crassula deltoidea* Harv. becomes *Crassula arta* Schonland. The garden label will read *Crassula deltoidea*, which leaves

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it quite vague which plant the owner has got, since the *deltoidea* which has become *arta* was for a long time in cultivation under the name which has had to be changed in accordance with the rules. The full names of the two plants, if mistakes in identity are to be avoided, should be "*Crassula deltoidea* Thunb. (non auct. al) (*Cr. rhomboidea* N.E.Br.)," which in plain English means the plant which Thunberg (but not other writers) called *Crassula deltoidea* and which Dr. Brown later called *Cr. rhomboidea*; and the second name is "*Crassula arta* Schon. nom. nov. (*Cr. deltoidea* Harv. et auct. al, non Thunb.)," which being interpreted means that *Crassula arta* is a new name given by Schonland for a plant which Harvey and other writers called *Crassula deltoidea* in ignorance of the fact that this name had already been used for another plant at an earlier date by Thunberg.

Sometimes a second authority is added in brackets, as "*Thlaspi rotundifolium* (Hook. f.) Gaud."; this means that the specific name *rotundifolium* was originally given by Sir Joseph Hooker (Hooker filius) but the plant was put by him in another genus (*Iberidella*); when transferred by Gaudichaud-Beaupré to the genus *Thlaspi*, the specific name was retained. The above method of citing the authorities

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shows that the specific name was originally given by the author whose name is placed in brackets but that it was transferred to another genus by the second author.

One other Recommendation is of interest to horticulturalists, this is XLIII :

“ Specific (or other) epithets should be written with a small initial letter, except those which are derived from names of persons (substantives or adjectives) or are taken from genera or vernacular names (substantives or adjectives). ”

This often proves a stumbling-block to gardeners and makers of catalogues ; it is fairly easy to know when a specific name is taken from a person's name as in *Rhododendron Smithii*, *Lonicera Douglasii*, *Viburnum Sargentii*, but the specific names derived from generic names are less easy for the layman to recognize. Some people solve the problem by writing all specific names with a capital letter ; this is quite wrong and has no authority behind it. Others again use a small letter for all specific names, which is the American fashion ; this is a great convenience and in fact has even been proposed by botanists, though it is doubtful if many of them would agree to it. A proposal has been put forward by the Horticultural Conference (whose work is referred to in the next chapter) that the use of the small letter be made general, but this

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has not yet been accepted and, in the meantime, the above rule should be adhered to as far as possible ; other variants sometimes adopted, such as using a capital letter for specific names taken from places, have no standing and should not be adopted. In cases of doubt, the botanist may have to institute a search through a number of books available only in large libraries, but the gardener will not go far wrong if he takes the Kew Handlists¹ as his guides ; these lists, which are continually being revised, are available to everyone and are invaluable to anyone who wishes to be as accurate as possible without going the length of botanical research.

Although the full rules appear to deal with any difficulties that may arise, there is always the possibility that two interpretations may be made by different workers ; Article 73 provides for the establishment of a small permanent International Executive Committee with functions including the following :

“(1) *Interpreting the Rules in doubtful cases, and issuing considered ‘opinions’ on the basis of the evidence submitted.*

(2) *Considering nomina conservanda, nomina ambigua, nomina dubia and nomina confusa, and making recommendations to the next International Botanical Congress.*

¹ See Bibliography.

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(3) *Considering all proposals for the modification of the Rules and reporting thereon to the next Congress.*

(4) *Reporting on the effects of modifications of the Rules accepted at the preceding Congress."*

Truly the botanists are doing what they can to simplify and clarify a very complicated subject. When one considers the enormous number of early descriptions that have to be gone through and checked and the enormous number of new species continually being introduced, some of which the gardener is bringing into cultivation even before they are named, under the collector's number, the need of patience and understanding is obvious and the wise gardener will do his best to help by using the correct name as far as he is able even if no very obvious improvement seems likely in his lifetime. After all, what gardener of repute, amateur or professional, will hesitate to plant a tree simply because it will not attain its full stature or beauty during his lifetime? But if he may not see it himself in its maturity he will nevertheless give it his best care and attention, pruning and training it as it may require during its adolescence, hoping that generations to come may reap the benefit and admire its adult perfections.

V

Nomenclature of Garden Plants

“ For everyone almost, without consideration of kinde or forme, or other special note, giveth names so diversely one from another, that if any shall receive from several places the Catalogues of their names (as I have had many) as they set them down, and compare the one Catalogue with the other, he shall scarce have three names in a dozen to agree together, one calling that by one name, which another calleth by another, that very few can tell what they mean.”

So wrote Parkinson in “ *Paradisi in sole paradisus terrestris* ” of the *Narcissus* more than three hundred years ago. The problem, then, is not a new one, but it has become more urgent now that hybridization is better understood and more widely practised.

At the present time there is very considerable interest in species (that is in plants as they are found growing wild) before they have been improved or changed by cultivation and hybrid-

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ization. The grower of Alpine Plants tries to grow them so that they retain their characteristic form ; lovers of Shrubs are increasingly interested in the new importations as, for instance, the many new Rhododendrons that have come to us from the East in recent years ; in all those cases where the plants are true species their accurate naming is primarily the concern of the botanist and the method by which these names are to be arrived at, checked up and verified is adequately set out, as we have already seen, in the International Rules of Botanical Nomenclature. But there are a very large number of plants which we grow in our gardens which have been so changed from their original form that, in some cases, the species from which they have been derived is unknown.

Take, for instance, the case of the Tulip ; these flowers had been in cultivation for an indefinite period by the Turks and for at least two centuries by Europeans before Linnæus endeavoured to give them a specific name ; he grouped all the garden species he knew under *Tulipa Gesneriana* without thereby implying any recognition of the original wild plant from which they were descended ; the name *Tulipa suaveolens* was given in 1797 to the sweet-scented Tulip found wild in parts of England, though this was almost certainly not a native

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plant but a garden escape ; the many gorgeous varieties in our gardens to-day are derived from these two groups, but it is now quite impossible to classify them botanically.

The Rose too has been so long in cultivation that the origin of our cultivated forms can, for the most part, only be guessed ; and even the Lettuce, which is said to have appeared on the dinner-tables of Persian kings in 400 B.C., is unknown in the wild state ; Linnæus called it *Lactuca sativa* and thought it might have originated from *Lactuca Scariola*, but it is impossible now to be certain. The Carnation has been in cultivation for 2,000 years and probably originated from *Dianthus Caryophyllus*, a single flesh-coloured flower, but even in 1597 Gerard could write : “ to describe each new variety of carnation were to roll Sisyphus’ stone or number the sands.”

Then again there are certain species which tend to be variable in cultivation and give rise to “ sports ” which can be crossed between themselves to form yet other varieties ; such a plant is *Primula sinensis* Lindl. All the beautiful forms of this *Primula* which decorate our greenhouses are variants of the one wild species ; even the gardener’s so-called *Primula stellata* is actually *Primula sinensis* var. *stellata* Hort., a variety which is rather more definite than some

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of the others and can be segregated. Then again, all the varieties of Onion and Potato now in cultivation are simply forms of original wild species in each case, but these forms are so distinct and can be propagated, so that we must have some means of distinguishing between them.

The production of varietal forms by artificial means is the work of the gardener, whether amateur or professional, and it is he who has given names to his new productions. Here again we find that names have been given without a proper description of the plant by which it might later be identified; often a chance sport that appeared good but could not be propagated and so has dropped out of cultivation has been honoured by a special name and perhaps got as far as a nurseryman's catalogue.

And what of the names themselves? These have sometimes assumed a botanical air, sometimes they have been descriptive terms in the vernacular and often they bear the names of people it is desired to honour. Each year sees an enormous number of new florists' flowers brought before the public, many of which are valuable though some doubtless will drop into oblivion, but all must have names. If botanical nomenclature had got into a state of confusion, the naming of garden plants has become even

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more chaotic, as names have been given to new varieties by the producer, often, as has been said, without any inquiry as to whether the variety had been named before or even whether the name used had been previously applied to some other flower.

But in recent years efforts have been made to bring the naming of garden flowers under some control similar to that applying to wild flowers, and International Horticultural Conferences have met to discuss the various problems. The Conference which met in London in 1930 drew up a series of recommendations which were further discussed in Paris in 1932 and agreement was arrived at on the main points. The report states that :

“ The principles governing the naming of plants by botanists were accepted as the basis for the naming of plants of garden origin. . . . Names of species and botanical varieties are thus fully provided for. Plants raised in gardens as seedlings or sports of these species or as hybrids between species have often been named by non-botanical people, and the following rules, agreed to at the International Horticultural Conferences of London and Paris, are for their guidance.”

These rules are based on those drawn up by the International Botanical Congress but with special reference to garden plants.

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For instance, “*the name of a horticultural variety should be placed after that of the species to which it belongs, and its status should, or may, be indicated by the contraction ‘var.’*” The wording shows how difficult it is to make a definite ruling ; one would like to delete the “or may” and make the addition obligatory ; too often plants are seen labelled not only without being marked “var.,” but sometimes even the specific name itself is dropped and the varietal name alone is used, giving no indication that the plant which bears it is a variety and not a true species.

For garden plants the varietal name may only be latinized if it is either descriptive of some characteristic of the plants, such as *nanus*, *fastigiatus* or *albus*, or indicates its place of origin, e.g. *kewensis*. But if the name is, as is more usual, a fancy one, this may not be latinized ; thus, to quote the examples given, *Galega officinalis* var. *Hartlandii* is not correct for a form of garden origin ; it should be *Galega officinalis* var. George Hartland. Varietal names may be given in any language, and obviously the growers are likely to use that with which they are most familiar ; thus the beautiful Rose of French origin, “Le Rêve,” retains its name amongst growers in this country and does not become “the Dream.” Naturally when the

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garden plants have deviated so far that the wild species from which they arose cannot be determined, the fancy name alone is used, as with Roses, Tulips, Daffodils, Chrysanthemums and all the other so-called florists' flowers.

Then follow recommendations for the form that garden names should take. "*As far as possible names of horticultural varieties should consist of a single word ; the employment of not more than three words is permitted as a maximum.*" This is a wise and necessary recommendation ; it becomes cumbersome and confusing if the names are too long ; to use another French Rose as an example, "Souvenir de Denier van der Gon" is perhaps a pretty compliment to the gentleman concerned but rather much for rosarians in other countries to remember. Another point which will occur to anyone who has found how easily the names on garden labels partially disappear is that the simpler word is less likely to suffer corruption in this way, or indeed at the printer's hands in a catalogue. At this moment a very fine Rudbeckia is in danger of losing its true name, from which cause is not clear ; but *Herbstsonne* (Herbst = Autumn, Sonne = sun) appears at shows and in catalogues as often as not as *Herbstonne* (with one "s" missing)—which has no meaning.

"*Varietal names likely to be confused with one*

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another should be avoided.” This is a wise precaution and the examples given—“*Alexander should preclude the use of Alexandra, Alexandria and Alexandrina*”—makes the point clear. One would like to suggest that to have two Roses, one called Miss Willmott and the other Ellen Willmott, is not altogether desirable.

“*Where personal names are used to designate varieties, the prefix ‘Mr., Mrs., Miss’ and their equivalents should be avoided.*” This recommendation is not very faithfully carried out at the moment, but perhaps the grower finds it rather difficult, when he wants to honour a valuable client, to use plain “Jane Smith”; “Mrs. Jane Smith” does sound a little more courteous. Still, a Quaker lady, when a grower wished to call a flower after her, once agreed on condition that her Christian name alone was used, as being so much more suitable for a beautiful flower than title and surname. Other people about to be so honoured might follow this example, till perhaps public opinion would make it the correct thing for the title to be dropped.

It is also recommended that : “*The articles ‘a’ and ‘the’ and their equivalents should be avoided in all languages when they do not form an integral part of the substantive, e.g. ‘Colonel,’*

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not 'The Colonel' ; 'Giant,' not 'The Giant' ; 'Bride,' not 'The Bride.' "

"Existing names in common use should not be altered to conform to these rules, but attention should be paid to them in all new names proposed."

This, of course, is as it should be, and all gardeners and flower-lovers can, if they will, help to see that these recommendations are carried out. If a grower displaying his latest triumph, which he has named "Mrs. John Henry Albert Smith" say, were to have it suggested to him by admirers of the flower that, beautiful as it might be, it was obviously not a new production as the name in no way conformed to the modern recommendations on the Nomenclature of Garden Plants, that particular triumph would very soon find itself re-christened.

The publication of garden names is a very important matter to which far too little attention has been paid in the past ; many names have been given to plants which have since dropped out of cultivation and often no description remains to say what they were like or what was their origin. Even to-day new names are given too casually ; garden varieties are being produced at such a rate that it would be well if names could be withheld for a year or two until the plant had proved its garden worth ; but it is unlikely that this will be done to any

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large extent, for the public does not buy plants under number except in special cases. The publication of a garden name is not quite comparable with the publication of a botanical name, which can always appear in a suitable scientific Journal. To quote the recommendations again :

“ In order to be valid a name must be published. The publication of a name is effected by a recognizable description, with or without a figure, in any language written in Roman characters. The description must appear in a recognized horticultural or botanical periodical, or in a monograph or other scientific publication or in a dated horticultural catalogue. The mention of a variety without description in a catalogue, or in the report of an exhibition, is not valid publication, even when a figure is given. It is desirable that descriptions of new varieties in horticultural catalogues should also be published in periodical horticultural papers.”

It is to be hoped that these suggestions will be carried out in the future ; specialists in certain classes of plants have already realized the necessity of trying to restore order out of chaos and have instituted a scheme for registering new names, having prepared lists of those already in use to avoid duplication. The more this can be done the better for everyone ; it is work which the specialist societies can and are under-

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taking, and all raisers of florists' flowers should make themselves conversant with the work as far as it concerns their own plants and abide by any rulings that are drawn up for the assistance of nurserymen and the general public.

The difficulty of getting plants correctly named is aggravating to the private gardener, but to the nurseryman it may be a more serious problem ; his clients expect him to know all about it ; if they are familiar with the plants themselves they will expect his catalogue to be accurate, while, if they do not know the names, they are bewildered at any changes made and apt to think it is a trick of the dealer to induce them to buy one plant twice over under different names. The nurseryman has troubles enough to cope with in bringing on and propagating his stock ; it is not fair to expect him to turn botanist too. The Horticultural Conferences have realized this and have drawn up a list of those genera which are sometimes divided by botanists, with recommendations as to the generic names to be used in horticulture. “ *At the Horticultural Congress in Rome in 1935 a list of specific names of plants of horticultural interest was agreed for international use for the ensuing six years, and in addition certain lists of names of garden varieties were also adopted as standards for future use.*” At the time of writ-

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ing (summer, 1937) this list is not available, but the list of *generic* names agreed at the earlier (Paris) Conference is given in the Gardener's Chronicle XCVII, p. 28, 1935 ; this list includes all classes of plants grown in gardens, and about three hundred generic names are recommended whilst some hundred and fifty others are given which it is thought should be dropped ; for instance, *Thea* is united in *Camellia*, *Imantophyllum* in *Clivia*, whilst *Prunus* now covers all the generic names that have been used from time to time such as *Amygdalus*, *Armeniaca*, *Cerasus*, *Padus*, *Persica* and *Laurocerasus*. This list (and subsequent ones as they appear) should be consulted and its recommendations adopted by everyone interested in the ultimate solution of the problem of plant names.

VI

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Having seen that, for all plants, whether wild or cultivated, there are definite rules governing the names by which they should be called and recommendations as to the form these names should take, it would be as well to see who it is that bestows the names. Unfortunately a new plant is not found with a neatly written label sitting beside it ; if the finder is a botanist he may be sufficiently conversant with the group to which it belongs to say at once that it differs from the other species widely enough to be reckoned as a new species and he can then and there give it a specific name. But more often the people who send home new plants, though they may be familiar with their subject, would yet hesitate to say that any discovery is a “ new ” plant ; it may be new to the district they are covering but may also occur in other parts of the world, of which they know less ; to be quite sure that a plant is really a new one demands a certain amount of research, and a collector,

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far from civilization, cannot carry with him all the books he is likely to want, so that it is usual for plant collectors to prepare herbarium specimens—that is, the plants are dried and pressed and finally mounted on sheets of paper. These sheets, which will each bear a distinguishing number, and notes of the locality, etc., where the plant was found, or reference to field notes which contain this information, will be sent home to some botanical institution where the necessary research can be carried out. In this country, most of the material is sent to Kew where there is one of the most complete herbaria in the world. Each sheet will then be checked with the plants it most resembles; if the genus to which it belongs has received considerable attention in another country it may be necessary to consult material in the chief herbaria of that country also. Suppose the result of this thorough search proves that the plant is not so far represented in the Herbarium it is yet necessary to check further; if an earlier collector has worked over the same field, it is possible that he may have been unable to send home herbarium material of all the plants he collected but may, nevertheless, have described the plants accurately and they may have received names, in which case any written records likely to concern the

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plant in question must be sought out and examined.

When it seems quite certain that the plant really is new to science, has never been described before and is sufficiently distinct from its fellows to be regarded as a different species, then it has to be given a name. Sometimes the collector may suggest that if the plant proves to be a new species he would like it called so-and-so, but as a rule the supplying of a name and full description, in Latin as well as in the vernacular, is left to the botanist who has undertaken the research. He will then, if he is a botanist of repute, follow the International Rules and see that the plant gets a suitable, pronounceable name and that this is validly published, in accordance with the Rules, that is, the description will be printed in an appropriate journal.

As well as sending herbarium sheets to assist in the identification of his plants, the collector will also send home seeds and plants whenever he can ; these are usually divided between the scientific and horticultural institutions and the private individuals who have helped to finance the expedition ; this is an excellent plan as the varying conditions under which they will be grown give a greater chance of survival, especially if any plant should prove difficult. But these plants and seeds will not bear names, only

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numbers and the collector's distinguishing mark, generally a letter. It is quite possible that some of the plants may reach maturity and flower before the person working on the dried material is satisfied that he is justified in giving a name ; if the seed has germinated freely and grown on well there may be considerable stocks, more than their raiser requires for himself, and plants will be distributed to other growers interested to possess them ; the lists of plants available for distribution from Wisley contain, from time to time, offers of plants and seeds still under number.

The collector will be able to notify those people to whom he originally sent the seed when it has finally received a name ; but he cannot tell how far distribution has gone, so that it would be very useful if, as names are arrived at, they were published in some well-known gardening paper together with their original numbers. People do not like numbers for too long and, if they cannot discover whether a name has been assigned to their plant, they are apt to hunt around and try to find one, perhaps by comparison with nearly related species, and the chances of mistakes are obvious.

As a rule the Herbarium material is prepared from flowering specimens ; the collector may have to return weeks later to collect ripe seed

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and perhaps, on his return, he may find some accident of man or nature has robbed him of his harvest ; in that case, the only record of the plant's existence is in the herbarium sheet and field notes ; science is the richer, but our gardens have gained nothing. If a plant appeared to be especially promising for introduction into cultivation, later expeditions will try and make a special point of getting it. There are still a number of plants which collectors have reported as likely to make first-class garden plants but whose seed has not so far been sent over or, if sent, has not survived.

Expeditions sent out by scientific or horticultural institutions and many others will work along these lines, but anyone who finds a new plant is at liberty to give it any name he likes ; the name, of course, does not become valid until it is properly published and a novice of no botanical standing may find it difficult to persuade a reputable journal to accept his descriptions and this acts as a useful curb to over-enthusiasm. In practice, the naming of new species and the working over of old material in the light of new knowledge is almost entirely in the hands of people with botanical training, generally working in connection with some botanical institution ; the risk of duplicating names is well known and it is unlikely that the

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finder of a new plant would hasten into print without due consultation with the specialists. Once it is published a name becomes subject to the Rules of Botanical Nomenclature, but the acceptance or otherwise of new names or changes of names cannot be referred to any definite authority; the tribunal which must eventually act as judge is informed botanical opinion and there is no reason why this should be unanimous, two or more sets of views may be equally tenable. Anyone who makes any changes, splitting up species, establishing new genera or new families should be extremely careful and weigh well all the circumstances before launching a set of new names on an already overburdened world. The pleasure of seeing his own name after that of a new plant should never be an incentive to making such new names unnecessarily; unfortunately this is by no means unknown, but it is deprecated by all honest workers who think beyond their own small circle.

As regards the names of plants already in use, if a well-known and often-used name is in danger of being changed, it is possible, as we have seen, for it to be added to the list of *nomina conservanda*, but the botanists who meet at the International Congress are only concerned with names *after* they have been given,

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they are not responsible or able to influence, except by recommendations, the giving of names.

So many new plants are being introduced and so many different people are working, each at his own group, and there are so many publications in which plants can be described for the first time that it becomes increasingly difficult to prevent overlapping. In an ideal world, doubtless, each competent worker would have his allotted portion for which he alone was responsible. Under present arrangements, anyone is at liberty to take up any group that interests him ; if two different people study a given genus and receive new plants as they are found, the chances are entirely against their arriving at the same conclusions in regard to them. Unfortunately, human nature being what it is, there is likely to be rivalry rather than co-operation between them ; perhaps, even, the same species will receive a name from each, and nurserymen may easily adopt either or both names and circulate them in all good faith, without ascertaining which is valid. This is not the fault of the International Rules ; it is due to the lack of co-ordination between the various workers in this vast field. No one can hope to have a good working knowledge of more than a few families, so that the work is

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necessarily divided up. What is wanted is a sort of clearing house which, to be effective, would have to be international; there is no final authority who can say what is right and what is wrong, nor do the circumstances permit of so definite a ruling, but it might be possible for a small committee to be formed who would be able to intimate whether, in a general botanical opinion, a group of plants was being split up too far and to give some guidance as to what the ordinary person interested in growing these plants might reasonably expect. The real difficulty is that each worker presents his results how and as he will and the consensus of opinion is only arrived at very indirectly and after a long period of time. Experiences at Geneva hardly encourage one to hope that an International Botanical Clearing House will be achieved in our time. After all, if one wants to grow the most recently introduced plants, one must put up with some difficulties.

In the meantime, there are some old favourites that have been long in our gardens whose names have been changed in recent years, sometimes to the bewilderment of their growers. It would be a great thing if the plants represented, say, in the catalogues of the leading nurserymen could be checked through for accuracy and a list of the valid names published; as it is,

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even under the rules, a well-known plant such as *Larix europaea* DC. may suddenly be found to be living under a false cognomen since an earlier and valid name was *Larix decidua* Mill., and this discovery was made because someone got interested in the genus and investigated it more thoroughly than has been done for some years. This change is a particularly annoying and unfortunate one, for tree-lovers must be so familiar with the Common Larch under De Candolle's name that to have to change it now to the earlier name given by Miller seems to serve no useful purpose. But the International Botanical Congress does not feel it can recommend the conservation of specific names (the *nomina conservanda* are all generic names) and, to be logical, the change must therefore be made. This change in the Larch's botanical name is so recent that the Kew Handlist of Coniferae (1925) gives the older name, as does W. J. Bean in "Trees and Shrubs" (4th ed., 1925). Two catalogues consulted at random give "*Larix decidua (europaea)*" and "*Larix europaea* DC. (*decidua*)," which at least saves the prospective buyer the annoyance of purchasing under a new name a plant which he already possesses under the old one. It is annoying for the catalogue-makers to have to resort to this extra printing, but a reliable catalogue—and there

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are many nowadays which are very carefully compiled—is probably one of the best guides that the ordinary gardener will have.

Some of the corrections and alterations made by botanists appear to take a very long time to filter through to the gardener ; for instance, people are speaking and writing to-day as though the genus *Andromeda* had recently been split into the genera *Oxydendrum*, *Pieris*, *Lyonia*, *Leucothoe*, *Cassiope*, *Zenobia*, *Enkianthus*, etc., leaving *A. polifolia* L. as the only true *Andromeda*. Modern catalogues give, under *Andromeda*, references to the other genera, evidently anticipating that their clients will need guidance ; and yet this genus was split up by David Don in 1830 and is so given in Loudon's "Trees and Shrubs of Great Britain" in 1875, though in the "Handbook of Hardy Trees, Shrubs and Herbaceous Plants" by Decaisne, Naudin and Hemsley in 1873 the split is not recognized. The Kew Handlist of Trees and Shrubs (1934) also gives, under *Andromeda*, references to the other genera.

But some of the changes we are apt to deplore are the result of further knowledge and investigation. Take the case of *Gentiana acaulis* L., ; it is quite uncertain to-day to which plant Linnæus gave the name *acaulis*. The plant we grow in our gardens may be a hybrid, or perhaps

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G. Clusii Perr. et Sorg. or *G. Kochiana* Perr. et Sorg. ; in any case it is now quite clear that there are a number of nearly related forms worthy to be raised to specific rank. Let us see what Reginald Farrer says (in the "English Rock Garden") :

" *G. acaulis* L. This august name has at last burst asunder with the number of definite species that it has been called upon to contain. No one who has ever met Gentians on the Alps can have failed to see that the name ' *acaulis* ' was made to cover so much that it ultimately came to mean nothing at all. And, as for the *Gentiana* ' *acaulis* ' of gardens, this, it is clear, has nothing to do with any form of any species at present known on any of the hills of the world."

Farrer proposes, on what authority he does not say, that the name *acaulis* be used for the group only and that the garden *acaulis* be known as *Gentian Gentianella*, thus making a specific name of a common one. In the latest work on the Gentians, D. Wilkie speaks of the *acaulis* group and includes therein *G. acaulis* L., *G. alpina* Vill., *G. angustifolia* Vill., *G. Clusii* Perr. et Sorg., *G. dinarica* G. Beck and *G. Kochiana* Perr. et Sorg. The Kew Handlist of Rock Garden Plants (1934) more or less agrees but considers *G. Kochiana* Perr. et Sorg. to be

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a synonym of *G. acaulis* L. Here the gardener and the botanist are at one ; the differences between these plants—the small form of *alpina*, the large flowers of *Clusii*, the unspotted colouring of *dinarica*—are obvious to anyone who has grown them and are also recognized scientifically ; the grower wants more names for the different types and the botanist has supplied them.

Another interesting case is that of the genus *Pyrus* ; older writers have, from time to time, recognized a number of genera such as *Pyrus* (Pear), *Aria* (Whitebeam), *Aucuparia* (Mountain Ash), *Aronia* (Chokeberry), *Malus* (Crab), *Eriolobus*, *Mespilus* (Medlar), and *Cydonia* (Quince). Bentham and Hooker in “ *Genera Plantarum* ” united most of these genera into one large genus *Pyrus*, but later workers have tended to restore the smaller genera, for there are distinct differences in their fruits. The matter is now more or less settled ; in the fourth edition (1925) of “ *Trees and Shrubs Hardy in the British Isles* ” W. J. Bean retains the name *Pyrus* for all those species belonging to the groups *Aria*, *Aucuparia*, *Aronia*, *Malus* and *Eriolobus* ; *Mespilus* and *Cydonia* are excluded and treated as separate genera. In his additional volume, published in 1933, however, Bean recognizes four genera, viz. : *Pyrus*, *Malus* in which is

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included *Eriolobus*, *Sorbus* in which are united *Aucuparia* and *Aria*, and *Aronia*. The gardener who wishes to be accurate is in a quandary ; it may be easier to have one large genus and call everything *Pyrus*, but there is a general feeling that the Whitebeams and Mountain Ashes are sufficiently distinct to be treated as separate from the Pears. The difficulty is, not so much which generic name to use, but that the same specific name cannot always be retained if the species is regarded as in the genus *Pyrus* or in *Malus*, say. Thus the Linnæan name for the Apple was *Pyrus malus* ; later Miller called it *Malus pumila* ; if the genera *Pyrus* and *Malus* are separated the generic name of the Apple becomes *Malus* and should take the earliest valid specific name, which would be *malus* (from *Pyrus malus* L.) ; but such a combination as *Malus malus* is not permitted under the International Rules, so that the second oldest specific name must be used, that of Miller. The Apple, then, is *Pyrus Malus*¹ L. or *Malus pumila* Mill., depending on the view taken of these genera.

Take another case ; the Bollwyller Pear was called *P. bollwylleriana* by De Candolle, but

¹ Capital "M" here because *Malus* has been used as a generic name since Linnæus used it as a specific one.

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an earlier specific name was *Pyrus auricularis* of Knoop. This tree, which originated at Bollwyller in Alsace before 1619, is a hybrid between the Whitebeam, *Pyrus aria*, and the Pear, *Pyrus communis*; if the aggregate genus *Pyrus* is used, the name of the Bollwyller Pear is *Pyrus auricularis* Knoop, but if the genera are split, then one parent, the Whitebeam, becomes *Sorbus Aria* Crantz, and the name of the hybrid is then \times *Sorbopyrus auricularis* Schneider and the hybrid origin is indicated by the name.

That attractive shrub which, ignoring all others from the same country, has long been known in gardens as "Japonica," is now *Cydonia japonica* Pers., the Japanese Quince, though before the genus was split up again it was known as *Pyrus japonica* Thunb.; but its cousin, the Common Quince, must change its specific name in changing its generic one, for Linnæus called it *Pyrus cydonia*, so that on transfer to the genus *Cydonia* it has to take its next oldest specific name and become *Cydonia oblonga* Mill. as *Cydonia cydonia* is not permissible under the rules. The latest edition of the Kew Handlist of Hardy Trees and Shrubs (1934) and the list of genera recommended by the Paris Horticultural Conference both recognize the splitting of *Pyrus* into smaller genera, a practice with which most

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gardeners will agree, and to which all should subscribe.

In the other genus that provides so many of our flowering trees, the case is different ; *Prunus* is now considered one large genus which comprises, not only the Plums proper, but also *Amygdalus* (Almond), *Cerasus* (Cherry), *Armeniaca* (Apricot), *Padus* (Bird Cherry), *Persica* (Peach) and *Laurocerasus* (Cherry Laurel) ; in all these the fruit is of the same type and one-seeded. For convenience, the various species are usually grouped together in subsections under the older generic names. The beautiful Japanese Cherries have been grown for very many years in Japan and their nomenclature is unfortunately confused ; often the origin of a form is also unknown, but most of them appear to be hybrids between *Prunus serrulata* Lindl. and *P. Lannesiana* Wilson ; some of the older of these hybrid Cherries were given specific names as though they were true species, and the species from which they have been derived have only been discovered much later, which has led to a curious inversion of the usual process. For instance, *Prunus subhirtella* Miquel is not known in the wild state ; *Prunus subhirtella* var. *autumnalis* Makino was originally introduced as *Prunus Miqueliana* Hort., but it is more probably a variety of

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P. subhirtella, noted for its habit of coming into flower in November; there is another variety, *P. subhirtella* var. *pendula*, of weeping habit, and Mr. E. H. Wilson's researches have brought to light *P. subhirtella* var. *ascendens* which is found wild and is probably the original type, but, reversing the usual order, though following the Rules, this has had to be given a varietal name. Most of the Japanese Cherries, however, are known by their native names, as a rule without the addition of the specific name, as it is extremely difficult in many cases to be sure which species were the parents.

Much has already been done to clear up the confusion, much yet remains to do. And some errors will probably be perpetuated to the end of time. Who does not call those effective, scarlet bedding plants Geraniums? yet they ceased to be Geraniums as long ago as 1787—and most people know it! Linnæus put all the known species into the genus *Geranium*; in the late eighteenth century many new species were arriving from the Cape and those in which the flowers were irregular were separated by l'Héritier from those with regular flowers as *Pelargoniums*. But the hybridization of "Geraniums" had already begun, they were widely grown for decoration and the change of name has been so hard to make that even those who

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know that the many garden forms to-day are descendants of *Pelargonium zonale*, still call these hybrids Geraniums ; one might almost say that Geranium has become the “common name” for certain Pelargoniums.

Another curious confusion that dies hard is that between Syringa and Lilac ; the botanical name of the Syringa is Philadelphus, that of the Lilac is Syringa ! This confusion has a venerable history ; if we look up the old botanical works, such as the Herbals, we find the beginnings of it. Take, for instance, Parkinson in “Theatrum Botanicum” (1640) ; there he gives “Syringa. The Pipe Tree.” Improving on the information already given in his other book “Paradisi in sole,” he now enumerates five sorts :

1. *Lilac Matthioli sive Syringa flore coerulea.* The blue Pipe Tree or Lilac “which riseth sometimes to be as great as a meane apple.”

2. *Lilac sive Syringa flore lacteo sive argenteo.* The silver coloured Pipe Tree.

3. *Syringa Persica sive Lilac Persicum incisifoliis Iasminum Persicum dictum.* The blue Persian Iasmine or Pipe Tree.

4. *Syringa flore albo simplici.* The single white Pipe Tree. The flowers are “many set together, consisting of foure leaves, as large as Muske Roses, and of the same creame colour,

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with many small yellow threds in the middle, of a strong sweet, full and heady sent, not pleasing to a great many."

5. *Syringa Arabica flore duplici*. The double white Pipe Tree.

All but the second sort are illustrated and, from the pictures and descriptions, it is clear that 1 = *Syringa vulgaris*, the Common Lilac ; 2 = a colour variation of 1 ; 3 = *Syringa persica* ; 4 = *Philadelphus coronarius* ; 5 = *Jasminum Sambac* ! As soon as the plants became better understood, these were separated and Tournefort chose the generic name *Syringa* for the fourth species, making it *Syringa alba* ; Linnæus, however, chose the name *Syringa* for the first or Common Lilac, when he revised the then-known flowering plants. But Tournefort's name was already familiar to many people and persisted in garden usage, so that to-day we still call *Syringa* the plant to which he originally gave the name but which Linnæus and subsequent writers have recognized as *Philadelphus* ; in France too the popular name for *Philadelphus* is *seringa* !

VII

In Conclusion

The ways in which plants get their names and the means devised for checking and clarifying the work have now been considered. No attempt has been made to give the meanings of the names themselves ; it may be a help to remembering them if their meaning is understood, but there is a definite danger in relying on these meanings too closely ; the sense in which they were applied may have been more apparent to a botanist years ago who knew only a few members of a genus than it is to-day when far more species are known ; for instance, one of our smaller *Cymbidiums* has the specific name *gigantea* and, at the time this was given, it was the largest species known in the genus. Again, the adjective *hirsuta* may have been applied, not to the leaves which would be the obvious meaning, but perhaps to the ovary or some other less obvious organ. To know the meanings of specific names may be of the greatest use, provided this sort of thing is

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taken into account, and there are a number of good lists available for general use.¹

What it all comes to is this, the problems have been realized and steps are being taken to combat them, but it will be a slow job ; in the meantime it can only be urged again that everyone who has anything to do with plants should try and be as accurate in the names he uses as possible. This applies especially to those who are responsible for the distribution of plants ; it used to be an old reproach that the makers of plant catalogues liked to get hold of a variant name and thus have, apparently, two plants to offer unsuspecting purchasers, so that even a very knowledgeable gardener once acquired unwanted Roman Hyacinths under the attractive sounding name of *Bellevalia romana* ; but it is doubtful if this sort of thing is done intentionally nowadays to any great extent. Reputable firms are taking more and more care in the preparation of their lists, so that very often these lists are of the greatest assistance to gardeners ; it is not unusual for the nomenclature to be based on that of the Kew Handlists, which are probably the most reliable guides the gardener can have.

One of the difficulties is that, however willing the layman may be to be accurate, he seldom

¹ See Bibliography.

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has the means of finding out for himself the truth in doubtful cases ; for this, a very complete botanical library is necessary and generally some botanical knowledge is wanted too. So that it is to the botanist we must look for the correcting of names and clearing up of doubtful cases ; but once this is done the information should be readily available to the gardener, as far as plants grown in our gardens are concerned. It is no good having a name-change recorded in some abstruse botanical journal ; it will probably take a long time for it to filter through to the plantsman. What is wanted is a much closer union between theory and practice, or perhaps the horticultural societies could act as go-betweens and see that all important name-changes are recorded in horticultural journals. The ideal would be if a few people with botanical training and adequate library facilities could devote the next year or two to going through the plants most commonly grown and checking the names in use to see if they are accurate and in accordance with the rules ; it might make rather a nasty upheaval at the time, but it would avoid the uncertainty that the gardener feels as to which names really are right and which may be changed owing to a chance bit of research.

If such a revised list were available for con-

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sultation it would be an enormous help. As it is, beyond the Kew Handlists, the average intelligent gardener has very little that is really authoritative ; these Handlists are revised from time to time, but not all sections are dealt with at the same time and, as can be seen from the following list, some have not been revised for thirty years now, in fact not since the Vienna Code came into force :

Coniferae, Cycadaceae and Gnetaceae	. 1925
Ferns and Fern Allies	1906
Orchids	1904
Tender Monocotyledons (Out of print)	1915
Tender Dicotyledons	1931
Trees and Shrubs	1934
Herbaceous Plants	1925
Hardy Monocotyledons	1925
Rock Garden Plants	1934

It is important, when using the Kew Handlists, to consult the latest edition ; differences will be found between the 1925 and 1934 editions of the Handlists of Hardy Trees and Shrubs and of Rock Garden Plants and, unfortunately, the lists are not always in agreement with the generic names recommended by the Horticultural Conference at Paris ; for instance, it is recommended that *Edraianthus* be merged in *Wahlenbergia*, but in the Kew Handlist the two genera are kept separate ; and again, the

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Conference recommends the use of the separate genera *Hepatica* and *Pulsatilla* which are both united in the Kew Handlist under *Anemone*. But these divergences are few, and the gardener who follows the Kew Handlists will not go far wrong, whilst if he keeps the list of names proposed by the International Horticultural Conference also beside him, he will be as accurate as it is possible to be in this imperfect world.

Some botanists seem rather to consider the gardener as a nuisance ; he expects variations that have occurred under cultivation to be named for him and asks questions which necessitate the botanist leaving his job for the time being to investigate a matter that does not appeal to him as of great importance. Perhaps this too is a case where a go-between is necessary. The nineteenth century saw a tremendous increase in scientific knowledge, so that it was no longer possible for one man to have expert knowledge in several branches ; at best he could only hope to be master of a small section of one branch. This extreme specialization which has been forced on scientific workers has resulted in much—too much—work being carried out in water-tight compartments without reference to the results of other workers in adjoining fields. Such a condition of affairs is not in the best interests of any branch of science and we are

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now arriving at the time when some sort of linking-up process is required.

In any case it is certain that the botanist could learn a great deal from a better acquaintance with living plants than he will often acknowledge. Dried specimens are essential as an index, but whenever fresh material is available surely it would be better to examine this rather than to wait till herbarium specimens have been prepared and to rely on dried or spirit material only.

The sooner this tangle of nomenclature can be straightened out, not only as a series of abstract rules but in a thoroughly practical manner, the better for everyone ; the need has long existed ; to-day, owing to the increasing use of species as distinct from horticultural hybrids in our gardens, it has become urgent. When one reads some of the early writers one realizes that the problem has long been with us ; listen to what John Parkinson wrote in 1640 about the yellow water Flagge :

“ This is not *Iris* but rather *Pseudoiris* a bastard brother of that stocke : in the former ages of our fathers it was held by many to bee the true *Acorus* of *Dioscorides*, so ignorantly had the world been trained for many years, until scruples began to arise in mens mindes, not finding things answerable to their delineations

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in old writers, which caused them in these later times to be somewhat more inquisitive and diligent, to find out the true and genuine plants and give them their proper names . . . for thereupon although *Brunfelsius* call it *Acorus*, yet *Tragus* called it *Adulterinus*, and *Cordus*, *Gesner*, *Matthiolus* and others call it *Acorus falsus* and *Lobel Acorus palustris*, *Fuchsius*, *Turner* and others call it *Gladiolus luteus*, but *Dodonaeus Pseudoiris*, and others *Iris palustris lutea* which *Clusius* in speaking of the true *Acorus* saith that the most judicious take it to be the *Butomes* of *Theophrastus*."

We may smile to think that the old herbalists were having so much trouble over *Iris pseudacorus*, but how will some of *our* struggles appear to generations to come? What better legacy could this generation of gardeners pass on to the next than a very distinct improvement in the difficult subject of plant names, a real step forward? This means that everyone must help as far as in him lies, it behoves each of us to be "*inquisitive and diligent*." After all, plant names are not the only ones to suffer changes; there is the story of a foreigner who wrote indignantly to know why a certain scientific discovery had been attributed to Lord Kelvin when everyone knew it had been made by Sir William Thompson.

VIII

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The rules are given, without discussion, in English, French and German.

INDEX KEWENSIS, under the Editorship of the Director of Kew. First two volumes published 1893-5 ; supplements have followed in 1901-6, 1904, 1908, 1913, 1921, 1926, 1931.

This gives a list of all the genera and species of flowering plants with synonyms and author's names, localities and references to the first published descriptions ; it is kept up to date by supplementary volumes at five-yearly intervals. The work is expensive but can be consulted at a number of Libraries. A name is not necessarily the one in use because it appears

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in *Index Kewensis* ; it may have been displaced by more recent investigations.

KEW HANDLISTS

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Hardy Monocotyledons, 1925	1s. 6d.
Rock Garden Plants, 2nd Ed., 1934	2s. 6d.

These Lists include only the plants grown at Kew which, however, represent the majority of the plants in cultivation to-day. They may be obtained at the Kiosk (behind No. III Museum) in Kew Gardens or from the Stationery Office, Adastral House, Kingsway, London.

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